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Are We Doing Enough to Prevent a Nuclear Terrorist Attack?

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Abstract

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Are We Doing Enough to Prevent a Nuclear Terrorist Attack?

Who in the US government will we blame for failing to prevent a nuclear terrorist attack against the United States? Make no mistake about it; everyone will blame someone and there will be plenty of blame to go around. The Nation will demand and expect immediate attribution and punishment of the organization(s) responsible for the attack, but there will also be a demand to punish those in Washington who failed to prevent the attack. From the citizens of America will be calls for war, calls for resignations, calls for action, and everyone will want to know who to blame. Was the attack the result of another failure of the intelligence community? Did we make the right investments in technologies sponsored by the different agencies of the US government? Could the Department of Defense (DoD) have prevented this attack? Where was the Department of Homeland Security (DHS) and were they in charge? Even more directly, the Nation will demand to know who was in charge and why they failed. Is the White House to blame and what did the White House do to prevent the attack? Was Congress too occupied with political bickering to help defend the nation? Did our international partners fail us? What did the United Nations (UN) and the International Atomic Energy Agency (IAEA) know and what did they do to attempt to prevent this attack? How did the terrorists acquire the nuclear material? What did anyone do to prevent this attack and was the national and international effort coordinated and well led? These questions will last decades as this nation and others commit millions to determine who is to blame and what should have been done to prevent the attacks.

Similar to the events following the September 11, 2001 (9/11) attacks, there will be a congressional commission appointed to identify how the entire interagency community, the international organizations and agencies, and America's international

partners failed by allowing terrorists to gain access to nuclear materials, smuggle the nuclear materials into “protected” areas, and use the nuclear materials to attack the United States. The United States will take the appropriate action after a deadly terrorist attack, but it will be too late. The Nation will once again send the military to kill those responsible for the attacks but the military solution will not answer the lingering question of how was it possible that our nation publically acknowledged legitimate concerns about nuclear terrorism, yet failed to commit the resources and effort to prevent the attack. Someone, or more likely, everyone will share the blame, but why wait? The critical question that needs to be addressed immediately is why the US government should wait for an attack and a devastating blow to the United States before forming a congressional or national committee to prevent nuclear smuggling and a nuclear attack against the United States.

Instead of sharing the blame and pointing fingers after a nuclear terrorist attack, the Congress and the President should immediately establish a national bi-partisan commission to review the current status of the full spectrum capabilities to prevent nuclear terrorism. The effort of the newly appointed Commission to Prevent Nuclear Terrorism (CPNT) should include an honest look at the established unity of command of the current effort and the synchronization and the prioritization of the broad range of resources and organizations. The commission should review all of the topics related to nuclear terrorism. There is little doubt that most want desperately to avoid a nuclear terrorist attack and every single organization involved in the prevention of nuclear smuggling is attempting to do the right thing. The commission’s task should include ensuring that the government bureaucracies are not getting in their own way and that

everyone knows what everyone else is doing. The commission should examine successes and failures, allocation of resources and investment strategies, and establish "unity of command" across all government agencies.

There is clear precedence for the establishment of congressional or Presidential commissions to examine US national security. Two specific commissions were established and met before the terrorist attacks against the United States on September 11, 2001, but the recommendations for improving the security of the US were not adopted until after the attacks. The Hart-Rudman Commission was established in 1998 and released a report in February 2001 that recommended, among other things, a new National Homeland Security Agency to consolidate and refine the missions of the nearly two dozen disparate departments and agencies that have a role in US homeland security today.[1] The Gilmore Commission also met before 9/11. The Gilmore Commission was established as the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction for the President and Congress. Their first report was released in 1999 with four additional annual reports released by the end of 2003. At least 125 of the Gilmore Commission's recommendations were adopted by Congress and various government organizations, but not until after the terrorist attacks against the US.[2] Could the US have prevented 9/11 if the national leadership had adopted the recommendations before the terrorist attacks? Likewise, is it possible to take action now to prevent the nuclear nightmare or do we wait for the attack?

The prevention of nuclear smuggling is an essential first step in preventing a nuclear terrorist attack against the US. Without access to nuclear materials and without

the ability of the terrorists to smuggle the nuclear material or a “weapon” into a protected area, the United States is not threatened and an attack will not occur. The first steps are to understand the problem, know the current capabilities, and to develop a set of solutions designed to improve the ability to prevent nuclear material smuggling. In order to appreciate the scope of the problem of preventing nuclear material smuggling, this paper will review current US policies, the international programs and policies with a focus on the UN and the IAEA, the history of known nuclear material smuggling operations, the potential sources of nuclear material, current US and international efforts, nuclear detection technologies, and other programs to prevent nuclear smuggling. Finally a set of findings and recommendations will be presented. Throughout the paper the reader should keep in mind and try to formulate an answer to the fundamental question of “who in the US government will we blame” as we explore the current efforts to prevent nuclear smuggling.

Current US Policy

President Obama once said, “A potential game changer would be a nuclear weapon in the hands of terrorists, blowing up a major American city…And so when I go down the list of things I have to worry about all the time, that is at the top, because that’s one area you can’t afford any mistakes.”[3] Is this concern, at the top of the President’s national security list, reflected in the national security policy? The National Military Strategy (NMS) of the United States of America 2011 states clearly, “We will counter weapons of mass destruction (WMD) proliferation as it presents a grave and common threat to our Nation and others. Working through institutions, alliances and coalitions, we will dismantle proliferation networks, interdict movement of materials, further improve nuclear forensics capabilities, and secure nuclear, chemical, and

biological materials."[4] The NMS further states, "To support and advance our Nation's interests, the Joint Force will pursue security cooperation and help strengthen the defense capabilities of our allies and regional partners. We will support efforts to counter transnational and sub-state militant groups, and combat the spread of WMD and related materials."[5] The Quadrennial Homeland Security Review Report establishes a goal for the DHS to prevent the unauthorized acquisition or use of chemical, biological, radiological, or nuclear materials and capabilities:

> Malicious actors, including terrorists, are unable to acquire or move dangerous chemical, biological, radiological, and nuclear materials or capabilities within the United States. Although the Nation remains committed to preventing all attacks by terrorists and other malicious actors, certain chemical, biological, radiological, and nuclear attacks pose a far greater potential to cause catastrophic consequences. Consequently, particular attention must be paid to the security of dangerous chemical, biological, radiological, and nuclear materials and technologies.[6]

The DoD and DHS are not alone in preventing nuclear materials from being smuggled into the US. The Federal Bureau of Investigation, Department of Energy (DoE), the State Department, the Department of Transportation, the Office of the Director of National Intelligence, state and local governments, and multiple other agencies have goals and missions related to preventing nuclear terrorism and nuclear smuggling. Everybody seems concerned about preventing nuclear smuggling, but are the potentially disparate concerns, goals, and missions of all of the government agencies enough to prevent a nuclear terrorist attack? Are the efforts of the US government synchronized for efficiency and efficacy? The Honorable Jane Holl Lute, Deputy Secretary of DHS addressed this question when she testified before the United States Senate Committee on Homeland Security and Governmental Affairs:

> DHS cannot meet this challenge alone: other federal departments and agencies are engaged in this effort, as are state and local law enforcement agencies, foreign governments, and international organizations, such as the International Atomic Energy Agency (IAEA). We must do more to synchronize and integrate our efforts so that gaps are filled, unnecessary redundancy is avoided, and vulnerabilities are minimized.[7]

The Commission to Prevent Nuclear Terrorism investigation would include an in-depth look at the actions of Congress. For example, on July 16, 2009, which was coincidentally the anniversary of the first US nuclear weapons test at Alamogordo, NM, the Senate introduced S.1464 and the House of Representatives introduced H.R. 3244, both called the Nuclear Trafficking Prevention Act, to amend Title 18, United States Code, to establish the transfer of any nuclear weapon, device, material, or technology to terrorists as a crime against humanity.[8,9] A search of the Congressional Record at the Library of Congress reveals that 348 bills or acts in the 112th Congress and 517 bills from the 111th Congress contain the word “nuclear” in legislation with well over half of these addressing issues associated with nuclear terrorism, nuclear smuggling, and nuclear proliferation. Examples of legislation from the House and Senate include: Nuclear Forensics and Attribution Act, Western Hemisphere Counterterrorism and Nonproliferation Act of 2009, Stop Nuclear Assistance to State Sponsors of Terrorism Act of 2009, International Uranium Extraction and Milling Control Act of 2009, Enhanced Partnership with Pakistan Act of 2009, Nuclear Nonproliferation and Cooperation Act of 2011, Nuclear Terrorism Conventions Implementation and Safety of Maritime Navigation Act of 2012, WMD Intelligence and Information Sharing Act of 2012, and Department of State, Foreign Operations, and Related Programs Appropriations Act, 2013.[10]

Congress has spent considerable time addressing and discussing the concerns related to preventing nuclear smuggling and stopping nuclear terrorism. Legislation and money are part of the necessary means, but neither guarantees the successful ends to preventing nuclear smuggling. If the American government waits until after a nuclear terrorist attack to establish a commission to examine the prevention of nuclear terrorism then the answer to the question of 'did the US do everything possible to prevent a nuclear terrorist attack?' is —NO, WE WERE NOT ORGANIZED TO EFFECTIVELY PREVENT A NUCLEAR TERRORIST ATTACK. SO WHO IN THE US GOVERNMENT DO WE BLAME?

International Programs

Even if a government commission is established, the simple reality is that the US must rely on international assistance and cooperation in order to prevent a nuclear terrorist attack and stop nuclear smuggling. The international cooperation begins with the United Nations. In 2004 the UN approved United Nations Security Council Resolution (UNSCR) 1540. UNSCR 1540 has several elements related to preventing nuclear smuggling and nuclear attack to include:

> Affirming that proliferation of nuclear, chemical and biological weapons, as well as their means of delivery, constitutes a threat to international peace and security; the UN is gravely concerned by the threat of terrorism and the risk that non-State actors such as those identified in the United Nations list established and maintained by the Committee established under UNSCR 1267 and those to whom UNSCR 1373 applies, may acquire, develop, traffic in or use nuclear, chemical and biological weapons and their means of delivery; the UN is gravely concerned by the threat of illicit trafficking in nuclear, chemical, or biological weapons and their means of delivery, and related materials, which adds a new dimension to the issue of proliferation of such weapons and also poses a threat to international peace and security; and decides that all States shall refrain from providing any form of support to non-State actors that attempt to develop, acquire, manufacture, possess, transport, transfer or use nuclear, chemical or biological weapons and their means of delivery.[11]

On April 27, 2006, the Security Council extended the mandate of UNSCR 1540 for an additional two years with the adoption of UNSCR 1673. On April 25, 2008, the Security Council adopted UNSCR 1810 which extended the mandate of the UNSCR 1540 for a period of three years. The Security Council urged the 1540 Committee to continue strengthening its role in facilitating technical assistance by engaging actively in matching offers and requests for assistance, therefore strengthening its clearinghouse function. On April 20, 2011, the Security Council adopted UNSCR 1977 to continue to strengthen its role to facilitate the provision of technical assistance and to enhance cooperation with relevant international organizations. All of these resolutions impose binding obligations on all States to adopt legislation to prevent the proliferation of nuclear, chemical and biological weapons, and their means of delivery, and establish appropriate domestic controls over related materials to prevent their illicit trafficking. It also encourages enhanced international cooperation on such efforts. All of these UN resolutions affirm support for the multilateral treaties whose aim is to eliminate or prevent the proliferation of WMDs and the importance for all States to implement them fully.[12] The UN Security Council resolutions demonstrate the commitment of the 193 current members to preventing nuclear smuggling and nuclear proliferation, but that does not prevent terrorists and smuggling organizations from attempting to locate, transport, and secure nuclear materials.

Another international organization committed to preventing nuclear material smuggling and nuclear terrorism is the International Atomic Energy Agency. The IAEA has been described as, “The most important and authoritative nuclear security agency in the world. It has a well-deserved reputation as an objective, non-aligned, science-

based organization, and therefore, carries much moral authority."[13] In response to a resolution by the IAEA General Conference in September 2002, the IAEA adopted an integrated approach to protection against nuclear terrorism. This approach coordinates IAEA activities concerned with the physical protection of nuclear material and nuclear installations, nuclear material accountancy, detection of and response to trafficking in nuclear and other radioactive material, the security of radioactive sources, security in the transport of nuclear and other radioactive material, emergency response and emergency preparedness measures in Member States and at the IAEA, and the promotion of adherence by States to relevant international instruments. The IAEA also helps to identify threats and vulnerabilities related to the security of nuclear and other radioactive material. However, it is the responsibility of States to provide for the physical protection of nuclear and other radioactive material and the associated facilities, to ensure the security of such material in transport, and to combat illicit trafficking and the inadvertent movement of radioactive material.[14] The IAEA has a lead international role in tracking and preventing nuclear material smuggling. The security of the US partially depends on the success of the IAEA in this endeavor to defeat and prevent nuclear smuggling. International cooperation remains a key element of prevention, but that does not mean that attempts to smuggle nuclear materials will evaporate. As recent events have shown, nuclear smuggling is a real concern and the international community must remain vigilant and committed to each element of the overall effort of preventing nuclear terrorist attacks.

History of Known Nuclear Smuggling Operations

Since 1993 the IAEA has recorded more than 1,300 confirmed reports on incidents involving smuggling, theft, loss and illegal disposal, illegal possession and

transfer, or attempted illegal sales of nuclear or radioactive materials[15] and there have been over 400 incidents reported by governments to the International Atomic Energy Agency involving unauthorized possession of nuclear and radiological material, and related criminal activities.[16]

The most common smuggling operations involve radioactive isotopes like Cesium-137 from nuclear medicine therapy units, Cobalt-60 from food sterilization irradiators, Strontium-90 from communications generators, and Ammericium-241 from oil exploration sensors.[17] These radioactive isotopes are more widely available than special nuclear material like Uranium-235 and Plutonium-239. A terrorist group would not use the medical isotopes to design and build a nuclear weapon, but the isotopes could be used in a radiological dispersal device (RDD) to spread radioactive contaminates in a local area using conventional explosives. The radioactive material from an RDD would unlikely kill or severely injure anyone, but would make the clean-up more difficult and potentially have a significant psychological impact.

An example of a recent smuggling event occurred on April 11, 2012 when teams from a Turkish anti-smuggling unit seized two glass tubes containing 500 grams of Cesium-137 which they suspected was smuggled to Turkey from Russia through Georgia.[18] Of more interest are the reported cases of smuggling weapons grade nuclear material which, given appropriate quantities, can be used for a nuclear weapon or an improvised nuclear device. The total reported seizures of Uranium-235 and weapons grade plutonium between 1992 and 2006 were around 9.4 kilograms which is less material than is typically required to assemble a nuclear weapon.[19] However, this does not necessarily tell the entire story. For instance, according to a Czech police

investigation of a 1994 seizure in Prague of 2.7 kilograms of Russian-origin highly enriched uranium (HEU),[20] smugglers claimed they could deliver to buyers an additional 40 kilograms of HEU in the short term and 5 kilograms each month over the next 12 months.[21] The truth in the smugglers claim was never verified, but the potential to smuggle enough weapons grade material to build a nuclear weapon remains a real concern.

To many it is almost inconceivable to believe that all attempts to smuggle nuclear material have been interdicted or identified. What should worry everyone is what they don't know about what has been smuggled without detection or is in storage and available for smuggling to a terrorist group. If the success rate of interdicting nuclear material is similar to the success rate of interdicting drugs then the US may have a real problem. According to the San Francisco Chronicle, only 10 to 15 percent of the drugs that smugglers try to move are seized by law enforcement.[22] If the same interdiction percentages apply to nuclear materials then large quantities of fissile material has potentially been smuggled without detection and may be in the hands of terrorists or waiting to be delivered to a terrorist organization.

Sources of Nuclear Material

Most of the material associated with known nuclear smuggling attempts originated in the countries of the former Soviet Union. The nuclear material has come from nuclear power plants, military facilities, factories or mines in Central and Eastern Europe. In most cases, the packaging of the illicit radioactive material was not adequate, suggesting amateur operations, and represented a danger to the public and the environment. A professional or knowledgeable nuclear smuggling operation would properly package the nuclear material to decrease the chances of detection and

minimize hazardous exposure to the smugglers. The offender profile of known providers or sellers of the material was mainly persons of Russian nationality with little experience in handling radioactive material.[23]

The potential source of nuclear material, although historically linked to the former Soviet Union, can originate from multiple states and industrial or military operations. Almost all nuclear material sources are linked to nuclear reactors and as of July 2, 2012 there were 435 nuclear power plant units in 31 different countries with 62 new nuclear plants under construction in 14 different countries.[24] All nuclear power plants are potential sources of radioactive material and require safeguards to secure radioactive material. Additionally all countries with nuclear weapons programs either produced or are still producing large quantities of weapons grade plutonium and uranium. The weapons grade material presents the most dangerous threat if allowed into the hands of terrorists. Since 1945 the US has produced 100 tons of weapons grade plutonium and 994 tons of weapons grade uranium. The Soviet Union produced similar quantities.[25] Significant efforts have been put in place to control the weapons grade material and radioactive isotopes, but nuclear material smugglers and potential terrorist groups have attempted and will continue to attempt to exploit insider vulnerabilities and gain access to nuclear material. The reward is worth the risk and will remain a concern as long as weapons grade material exists. The unanswered question and concern is whether or not there have been successful efforts to acquire enough nuclear materials to build a weapon. If a terrorist group acquires enough material to build a nuclear device then the US and international community must prevent the weapon from being moved to a point where it will be detonated.

Current US and International Efforts

There are several US and international programs designed to manage and secure, as well as combat the smuggling of nuclear materials. Many of the programs have matured into multi-lateral and international cooperation programs and are led by elements of the State Department. A successful program must involve international cooperation since nuclear smuggling starts at a source of the fissile material and generally involves the transfer of the material across several international borders. The Preventing Nuclear Smuggling Program (PNSP) was established in the State Department in 2007 to help countries increase their capabilities to effectively stop nuclear smuggling. Specifically, PNSP focuses on increasing foreign governments' capability to respond to incidents of illicit trafficking in nuclear and radioactive materials by ensuring the entire spectrum of agencies involved, from the police to scientific experts to prosecutors, follow a single set of well-exercised national operating procedures. Sound response procedures are vital for foreign governments to successfully detect nuclear smuggling and prosecute those involved. PNSP is also dedicated to promoting international nuclear forensics cooperation and development of the best practices in the field.[26]

Another program at the Department of State is the Nuclear Smuggling Outreach Initiative (NSOI) coordinated by the Office of Weapons of Mass Destruction Terrorism in the State Department's Bureau of International Security and Nonproliferation. The NSOI seeks to enhance partnerships with key countries around the world to strengthen capabilities to prevent, detect, and respond to incidents of nuclear smuggling. In its bilateral partnerships, NSOI engages those countries seen to be most important to the global effort to combat smuggling of nuclear or highly radioactive materials.[27] The NSOI

team works with the government of each such country to reach a common understanding on its current capabilities to counter the nuclear smuggling threat and to identify ways that international partners can improve the full spectrum capabilities of the country. NSOI also negotiates a Joint Action Plan with the partner governments specifying in detail agreed priority steps to improve its anti-nuclear smuggling capabilities. This plan includes both ongoing efforts that should be completed as well as new efforts that should be undertaken, and thus serves to place all relevant cooperative activities with the partner government into a single, coherent framework. According to the NSOI website:

> NSOI has to date completed Joint Action Plans and developed anti-nuclear smuggling cooperative projects with Ukraine, Kazakhstan, Georgia, the Kyrgyz Republic, Armenia, the Democratic Republic of the Congo, Moldova, Tajikistan, Slovakia, and Uzbekistan. In Ukraine, for example, the established joint action plan includes 30 priority steps to improve Ukrainian capabilities; half of these steps involve ongoing efforts that need to be completed, and the other half involve new efforts that should be undertaken. The joint list of priority assistance projects includes seven projects on radioactive sources, seven on border detection, one on prosecution, one on nuclear forensics, two on anti-corruption training, and two on nuclear security. [28]

Similar joint action plans exist for the other nine countries participating in the NSOI and the effort appears to be growing in popularity.

Another effort led by the State Department is the Nuclear Security Summit and Global Initiative to Combat Nuclear Terrorism. The first Nuclear Security Summit was proposed by President Obama in 2009 and first held in April of 2010 in Washington, D.C. The summit was attended by 47 countries to include Russia and China. At the end of the summit the participating states:

> agreed on the urgency and seriousness of the threat; agreed to work towards the goal to secure all vulnerable nuclear materials around the world; reaffirmed the fundamental responsibility of nations, consistent with

> their international obligations, to maintain effective security of the nuclear materials and facilities under their control; and agreed to work cooperatively as an international community to advance nuclear security, requesting and providing assistance as necessary.[29]

At the 2012 Nuclear Security Summit held in Seoul, South Korea, the heads of states and key government leaders from 53 countries attended. Substantial progress was reported in the two years since the 2010 meeting in Washington. Highlights of progress reported at the summit include:

> 530 kilograms of HEU from eight countries were removed for disposal, an amount enough to produce about 21 nuclear weapons; several countries committed to repatriate their unneeded HEU; Ukraine and Mexico accomplished a total "cleanout" of all stockpiles of HEU; HEU equivalent to nearly 3,000 nuclear weapons in Russia and the US was down blended to low enriched uranium (LEU).[30]

Additionally, Russia and the US were working on implementing the plutonium Management and Disposition Agreement signed between the two countries at the Washington Summit, which will result in the disposal of enough plutonium for 17,000 nuclear weapons and Kazakhstan, in cooperation with Russia, the US, the UK and the IAEA, secured spent nuclear fuel which contained enough HEU and plutonium to make several hundreds of nuclear weapons by moving them to a new facility for a long-term storage; and Sweden returned several kilograms of plutonium to the US.[31]

Leveraging the momentum of the summit and the collection of international leaders, 19 countries signed a statement to continue to support counter nuclear smuggling (CNS) efforts and several others announced steps to strengthen their CNS capacities and to advance the international participation in national Counter Nuclear Smuggling Teams (CNST). The CNSTs are US sponsored enablers in the effort to prevent nuclear smuggling. They participate in joint activities by law enforcement, intelligence analysts and technical experts to enhance global competencies to locate

and secure black market materials and arrest those illegally possessing them. The CNSTs serve as highly specialized teams that continue to provide assistance to international partners and enhance the capacity to detect and respond to smuggling activities taking place within a country's borders and complements fixed radiation detection equipment along a country's perimeter. Since 2011, the US has worked with the governments of Lithuania, Slovakia, Ukraine, and others, to establish national CNS teams. Through the State Department's NSOI, the United States partners with key countries around the world to strengthen capabilities to prevent, detect, and respond to incidents of nuclear smuggling.[32] International cooperation programs are essential and will remain a cornerstone in this effort.

Nuclear Material Detection Technologies

But what if the international effort fails to identify and interdict the nuclear material and terrorists attempt to smuggle either a nuclear weapon or nuclear material into the US? One of the organizations with the responsibility to prevent nuclear material from entering the US is the Domestic Nuclear Detection Office (DNDO). DNDO's mandate is to improve the nation's capability to detect and report unauthorized attempts to import, possess, store, develop, or transport nuclear or radiological material for use against the nation, and to further enhance this capability over time. With assistance and participation from a wide variety of US Government departments and agencies, DNDO synchronizes and integrates interagency efforts to develop technical nuclear detection capabilities, characterizes detector system performance, ensures effective response to detection alarms, integrates nuclear forensics efforts, coordinates the global detection architecture and conducts a transformational research and development program for advanced technology to detect nuclear and radiological materials.[33] As part of their

effort, DNDO has worked with US Customs and Border Protection to deploy radiation portal monitors and other radiation detection technologies to seaports, land border ports, and mail facilities around the world. Today, these systems scan 100 percent of all containerized cargo and personal vehicles arriving in the US through land ports of entry, as well as over 99 percent of arriving sea containers. [34]

The capability of the radiation portal monitors and other detection technologies continues to advance but there is currently no fail-safe technology that provides absolute certainty that nuclear material passing through a detector is properly identified or even detected. There are simple physical and scientific limitations to the capability of technology to detect all nuclear materials in every possible configuration and shipping container. Sensors, both active and passive, are available that detect and identify nuclear materials but a determined adversary may employ techniques to prevent detection or significantly reduce the signature of the material.

Passive detectors typically measure gamma or neutron emission from spontaneous fissions and decays within the nuclear material. When the detector determines that the radiation from a source is more intense than the normal background radiation, the detector signals a possible source of the increased radioactivity. There are a number of common natural and manmade sources of radiation, such as cat litter, bananas, or granite that may trigger the detector. Once a radioactive source is located the specific element is identified through a more detailed spectral analysis. Currently, there are several types of passive detection systems deployed by federal, state, and local entities. Examples include but are not limited to: personal radiation detectors which are generally small, pocket-sized devices used as scanning tools to search for

and detect nuclear and radiological materials; hand-held radioisotope identification devices are designed to identify the radionuclides present in radioactive materials and sources and are used by law enforcement officers and technical experts during routine operations; radiation portal monitors which are large, usually fixed, detectors typically composed of polyvinyl toluene for gamma detection and helium-3 tubes for neutron detection, and are often used to scan vehicles or cargo at fixed chokepoints such as ports of entry and weigh stations; mobile and transportable detectors that are mounted in a ship, vehicle, or trailer and used for area surveillance, search, or temporary checkpoint deployments; and backpack based radiation detection systems used in mobile or checkpoint operations to search for nuclear threat materials.[35]

Active nuclear detection systems are commonly used for radiography or for secondary inspection.[36] Active detectors use gamma, neutron, or x-ray sources to interrogate the material or shipping containers causing isolated fissions, nuclear excitation and decay, or atomic excitations and decay. X-Ray imagery can be used to search for dense materials or unique configurations of materials associated with a nuclear weapon or nuclear material storage. Significant investments have been made by DHS and DoE to improve the efficiency, effectiveness, size, and cost of the detectors, but there remain serious hurdles for implementation. To support the development of these systems, additional research and development is needed in neutron and gamma ray sources, detection models, neutron and gamma ray emission data, and neutron and gamma ray simulation codes.[37]

Other Programs to Prevent Nuclear Smuggling

Despite the significant costs shouldered by DHS and DoE, they are not alone in technology investments and research. The DoD also invests money, resources, and

research efforts to prevent nuclear smuggling. A leader in the DoD research and development effort is the Defense Threat Reduction Agency (DTRA). The mission of DTRA is:

> To safeguard the United States and her allies from weapons of mass destruction (chemical, biological, radiological, nuclear, and high yield explosives) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects. DTRA accomplishes its mission by investing in basic research efforts at universities, national labs and DoD service labs, to enable future capabilities to better counter threats posed by weapons of mass destruction. DTRA facilitates productive relationships with other scientific organizations and seeks to identify promising research efforts overseas. To support the prevention of nuclear smuggling, DTRA advances capabilities to detect, identify and characterize WMD materials; and promises significant advancements in stand-off capabilities. Additionally, DTRA seeks new methods and materials to neutralize or destroy WMD systems, and investigates enhanced modeling and simulation of the interaction and response of WMD components and materials to explosive blast and/or neutralizing environment.[38]

DTRA supports customers throughout the DoD who have various missions related to preventing nuclear smuggling and defending the homeland.

Although not covered in this document, there are identified nuclear material interdiction and nuclear material security teams throughout the DoD and well placed in other government agencies. These highly specialized and well trained teams are capable of responding to support nuclear material interdiction throughout the US and the world. Although the composition and specific mission of these teams is classified, one should assume that several departments and agencies within the US government have these teams trained, equipped, and prepared for the specific interdiction missions with a rapid response capability.

The effort to prevent nuclear smuggling is comprehensive, joint, interagency, and international. The prevention effort spans almost every element of the DHS, DoD,

multiple other government agencies with the State Department assuming a significant role. The President has made preventing a nuclear terrorist attack against the United States a priority. Congress has allocated money and supported multiple government programs. What else can be done?

This paper has addressed many, but certainly not all, of the efforts to prevent nuclear smuggling. Preventing nuclear smuggling is a "whole of government" approach that is strongly coupled with international efforts. Because many US government agencies and international organizations have a role to play in the successful prevention of nuclear smuggling, success is inherently dependent of synchronization and integration of all capabilities. As one returns to the question of 'whom in the US government will we blame when a nuclear terrorist attack occurs?' there is not an immediately obvious answer. Still several questions linger: what is missing?; what are the risks?; can our massive bureaucracy stay out of its own way and prevent nuclear smuggling and/or a nuclear terrorist attack against the US or US interest?; what else can be done?; and ultimately, who is in charge?

A Time for Reflection

The 9/11 Commission Report wrote, "Now is the time for that reflection and reevaluation. The United States should consider what to do—the shape and objectives of a strategy. Americans should also consider how to do it—organizing their government in a different way."[39] These words, written after the devastating attacks against the United States, were penned in response to the failure to prevent such attacks. The commission met too late and well after grass was growing on the graves of those killed in the attacks on September 11, 2001. The commission was justified in offering a time of reflection and reevaluation but the opportune time for reflection and

reevaluation was before the terrorist attacks against the United States, not after. Now is the time for reflection and reevaluation of the policies, strategies, and actions to prevent nuclear smuggling and a nuclear terrorist attack against the US. Tomorrow will be too late.

Potential Findings of the CPNT and Recommendations

The reader should have little doubt that the whole of the US government and the many international organizations and states are committed to preventing nuclear smuggling and nuclear attacks against the United States or US interest. However, a similar statement could have been made on September 10, 2001 about the commitment to prevent terrorist attacks against the US. No responsible government wanted the attacks of 9/11 to occur and no government or international agency deliberately allowed the terrorists to attack the US. Nevertheless, the attacks of 9/11 did occur. Many believe that if appropriate actions had been taken and the government had listened to the recommendations of commissions established before 9/11 then the terrorist attacks would not have occurred and the wars in Afghanistan and Iraq prevented. Nuclear terrorism may also be preventable and a first step is the establishment of a commission to examine all current national and international efforts. When the President and Congress establish the commission to prevent nuclear terrorism they will review much of what has been presented in this paper. The commission will conclude that there are many organizations in place to prevent nuclear smuggling and a nuclear attack, but there is still work do be done. Like the 9/11 Commission, the CPNT will ultimately offer recommendations to improve the Nation’s ability to protect the country from attack and mitigate the identified risks. Some of the potential findings and recommendations from the commission are shown below.

Finding and Recommendations (1)

Finding: No one is in charge. There is absolutely no established unity of command or a command structure in place to provide the unified leadership required for this full spectrum effort to prevent nuclear smuggling and nuclear terrorist attacks. There are lots of people working very hard to protect the US from a nuclear attack and to prevent nuclear smuggling, but no one organization is in charge of synchronizing the joint/interagency/international effort, prioritizing investments, coordinating organizational overlaps, and standing before Congress and the President on an annual basis providing updates. One can easily hide behind and blame the bureaucracies, the gargantuan administrative hurdles, and the protection of the "rice bowls" of Washington, but this will be an unacceptable excuse in the eyes of the American public after 100,000 citizens die in a nuclear attack that may have been preventable. Nearly everyone in this business recognizes the lack of synchronized national leadership and yet no one does anything to provide a solution. There is not even a National Security Staff or National Security Council counter-nuclear terrorism or counter nuclear smuggling integrated policy committee.

Recommendations: The President should appoint a nuclear terrorist attack prevention czar to head the CPNT. The czar should report directly to Congress and the President on an annual basis providing updates and recommending necessary changes to keep American safe. The President should establish a joint/interagency task force and place the nuclear terrorist prevention czar in charge of all activities related to nuclear smuggling and preventing nuclear terrorist attacks. Additionally, an interagency policy committee should also be established to make a recommendation on how to

better organize the national effort and coordinate the interagency effort. Anything short of a unified national effort is unacceptable.

Finding and Recommendation (2)

Finding: Related to the first finding of the absence of an interagency chain of command is the lack of coordination required to respond to and conduct time-sensitive interdiction or material snatch activities. The interdiction could be inside the US or anywhere in in the world. The potential timeline for a snatch and secure operation may be very short and detailed information will need to flow quickly to the right organization leading the operation. Fusion of all available information will need to happen quickly with the support of the entire interagency and international community.

Recommendation: An interagency fusion cell must be established to coordinate the flow of intelligence and information. There are existing fusion cells that could potentially be used to assemble and disseminate information quickly, but only if all agencies and organizations were connected to the fusion cell. Every warrior and bureaucrat knows from experience that unless the interagency relationships are established and exercised well before the real-world event then success in a live operation is unlikely. Without a lead for the overall mission of countering nuclear smuggling, there will remain reasonable concerns across the security community about the ability to respond in a timely manner.

Finding and Recommendations (3)

Finding: Human intelligence (HUMINT) networks are the most important investment and essential for preventing nuclear material smuggling. Most, if not all, of the hundreds of attempts to smuggle nuclear materials that have been interdicted resulted from human intelligence and human network information sharing systems.

Recommendations: MG (Ret) Bruce Lawlor offers a great solution:

> The expertise in the US for investigating organized crime and illicit trafficking resides within the US law enforcement agencies…The US should strengthen the existing counter-smuggling authorities of the Immigration and Customs Enforcement and provide it with the resources to develop a counter-smuggling network of regional law enforcement agencies to combat illicit nuclear trafficking.[40]

Additionally, as the US continues to develop a HUMINT capability, the counter-nuclear smuggling community needs to maintain a focus on explicitly tracking sophisticated smuggling operations.

Finding and Recommendation (4)

Finding: Investments in detector technology need to be evaluated and prioritized. The author is not aware of any nuclear fissile material ever detected and interdicted by sole use of this technology. Perhaps the placement of detectors at international borders, ports, terminals, and other deliberate locations dissuades nuclear smuggling operations, but there is little reason to believe that detectors or detector technologies will prevent nuclear smuggling. There is no amount of money that could be invested in technology designed to detect and prevent nuclear material smuggling that would provide a complete solution. One of the lessons learned in the effort to defeat improvised explosive devices (IED) was for every multi-million dollar investment in technology developed to prevent IEDs, the adversary developed a counter-defeat strategy. In fact, as the technology advanced to defeat IEDs, the insurgents simplified their employment of IEDs by minimizing the technology required to detonate the devices. In other words, as the counter-technology improves, the insurgents (or smugglers) find a way to counter the capability and this counter-counter-technology often becomes harder to defeat and less vulnerable to advanced technology.

Recommendation: Investments in nuclear detector technology should be part of the national effort, but not at the expense of human intelligence networks. The real risk of large investments in detectors and detector technology becomes over-confidence and over-reliance on technology. There are many who believe that detector technology can solve most of the problems of nuclear smuggling and they are wrong. The misguided further believe that once the money is spent and the technology is deployed then the nation is secure.

Finding and Recommendations (5)

Finding: Complacency is a concern and increases vulnerability to attack and the probability of a successful smuggling operation. On the surface one might conclude that because so many organizations are invested in preventing nuclear smuggling that everything that could be done is being done. A complacency trap that must be avoided is that the United States is spending lots of money, the President has made preventing a nuclear terrorist attack a priority, and Congress is involved, therefore the Nation is safe. This attitude can lead to complacency and complacency increases the risk of attack. The attitude that all that can be done is being done, coupled with the fact that there has been a very recent real decline in known nuclear smuggling attempts, may keep this essential effort off of the "radar screen" of the national leadership.

Recommendations: Leaders of all organizations must demand due diligence from all who work to prevent nuclear smuggling. In addition, the annual briefing to the President and Congress will force an annual review across all agencies supporting counter-nuclear smuggling and should minimize the probability of complacency.

Finding and Recommendation (6)

Finding: The current sets of detectors employed in the US and across the world are not interconnected. Almost all detectors are operated in a stand-alone configuration with no external monitoring. Internationally, the US relies on host nations to man and support the border detectors used to prevent nuclear smuggling. In the current configuration, a border or customs agent in a host country can turn off the nuclear material detector without alerting the international community to the potential cross-border transit of material. There is already an existing International Monitoring System (IMS) designed to detect and monitor nuclear weapons tests. The IMS is a worldwide network of observational technology that is designed to verify compliance with and detection of confirmed violations of the Comprehensive Nuclear Test-Ban Treaty. Today the IMS is more than 80 percent complete. In fact, 254 of the IMS monitoring stations and 10 of the 16 radionuclide laboratories have been certified. These facilities are located all over the world.[41] The IMS is a great example of the type of international cooperation that should be leveraged to prevent nuclear smuggling and nuclear terrorist attacks.

Recommendation: The international nuclear material detectors should be networked and integrated into an international monitoring system that could stand alone as a separate international network or be integrated into the existing IMS. Integration into the existing IMS would enhance all non-proliferation efforts and strengthen the international effort to combat nuclear smuggling, nuclear proliferation, and monitor nuclear testing.

Finding (7)

Finding: Enough weapons grade material may have already been smuggled into the hands of terrorists. These unknown unknowns remain a real concern. If the interdiction rate of nuclear material is similar to the reported interdiction rate of drugs smuggled into the US, conservatively around 20 percent, then there could be considerable successfully smuggled U-235 scattered or concentrated in the world. Given that the total weapons grade U-235 confiscated between 1992 and 2006 was roughly 10 kg then with the 20 percent interdiction rate, there could easily be 40-kg or more of smuggled material available to terrorist. There may be more or there may be less but the threat remains real.

Finding and Recommendation (8)

Finding: The counter-nuclear smuggling and intelligence communities must continue to look for organized nuclear smuggling operations. Most, if not all, of the nuclear smuggling operations involved unorganized attempts to sell nuclear materials to which someone had access and took advantage of a chance to make money. In several cases, the smugglers were caught while they were trying to find someone to buy the nuclear material instead of smuggling the material for a pre-arranged buyer. In almost every case, the smugglers did not specialize in nuclear material, but took advantage of an opportunity to make money selling nuclear material even though their primary contraband was other illicit material such as cigarettes, drugs, or people. If an organized effort was committed to securing nuclear material and smuggling that material to a safe haven, then the chances of success would be much greater than the typical smuggling operations of the past. In fact, Bruce Lawlor predicts, “The increasing involvement of organized crime in the nuclear black market strongly suggest that absent

real changes in law enforcement activities in the Black Sea region, terrorist will eventually be able to buy enough fissile material there to build an atomic bomb."[42]

Recommendation: The US and the international community must remain focused on building comprehensive information sharing and human intelligence networks, as well as leveraging the current technologies, in order to prevent the unknown unknowns associated with nuclear terrorism. The intelligence community must remain committed to following every lead that might suggest the presence of a nuclear weapon or enough material to build a nuclear weapon.

Finding and Recommendations (9)

Finding: The US and the international community must remain creative in order to stay ahead of smuggling operations and prevent nuclear smuggling and nuclear attacks. The 9/11 Commission Report duly noted, "Imagination is not a gift usually associated with bureaucracies…It is therefore crucial to find a way of routinizing, even bureaucratizing, the exercise of imagination. Doing so requires more than finding an expert who can imagine that aircraft could be used as weapons."[43] Individually or collectively the US and international communities have not always demonstrated the necessary imagination and creativity to prevent a determined nuclear smuggling operation or anticipate nuclear smuggling scenarios. Although technology is useful, the community cannot rely too heavily on the technology as the principal means of preventing smuggling and continue to invest in human capital.

Recommendations: International red teams and specialized human terrain teams must be organized to consider unique sources of material, smuggling routes, smuggling vehicles, and highly specialized use of small quantities of nuclear material. The counter-nuclear smuggling red teams must constantly consider: new and old

sources of material, possible locations where the successfully smuggled material can be stored and weaponized, the most vulnerable targets that allow the easiest access of nuclear material, the details of how successful smuggling operations work, and what group has a real desire to acquire a nuclear weapon (this is not a trivial question considering that no organization has detonated a radiological dispersal device even though many organizations have had access to the appropriate material). The creative use of human intelligence and human networking must remain a primary effort to prevent nuclear smuggling. In order to defeat a determined adversary, who by definition operates in an asymmetric environment, the successful counter-smuggling operation must always expect the unexpected and anticipate the unanticipated. Imagination and creative analysis must become part of and strongly encouraged in the organizations charged with preventing nuclear smuggling. Finally, one must presume that the commitment to smuggle nuclear materials is as least as great as the commitment to prevent nuclear smuggling. Staying ahead of the smugglers and the terrorists requires a learning organization that is front loaded with creative thinking. Success also depends on a system that does not get in its own way.

Conclusion

There are actions the country should take now to improve the Nation's ability to prevent a nuclear terrorist attack. The first step in protecting the US from attack is preventing a terrorist group from gaining access to nuclear material and this requires an organized, synchronized, and well led US and international counter-nuclear smuggling effort. Millions of dollars have been spent and thousands of dedicated professional are committed to this international effort, but the attacks on September 11, 2001 are proof that money and resources are not always enough. No system or organization is without

fault and a periodic external review often identifies simple adjustments that may result in significant improvements in the organization. A counter-nuclear proliferation commission should be established to examine all aspects of the US and international programs and make recommendations to the President on ways to improve the "potential game changer" that the President keeps at the top of his list of concerns. The 9/11 Commission recognized and identified the necessity to continuously evaluate US investments, policy, strategy, and actions in order to adequately protect the US from attack. The Commission's final recommendation in their report was that "the Department of Homeland Security and its oversight committees regularly assess the types of threats the country faces to determine (a) the adequacy of the government's plans—and the progress against those plans—to protect American's critical infrastructure and (b) the readiness of the government to respond to the threats that the United States might face."[44] By applying the Commission's final recommendation toward the effort of preventing nuclear smuggling and a nuclear terrorist attack, some agency, perhaps DHS, or DoD, or maybe State, and certainly including the National Security Council, needs to assess the adequacy of the plans and policies to protect America from a nuclear terrorist attack and prevent nuclear smuggling. The CPNT and a counter-nuclear smuggling czar should be established and meet on an annual or semi-annual basis to provide their recommendations directly to the President. Waiting until after a nuclear catastrophe occurs to stand up a commission to examine the obvious failure of the US government should not be an option. The time to act is now.

Endnotes

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